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Inchoatives in causative clothing

Change of state in Modern Hebrew *heXYiZ*

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Abstract: The “causative” template *heXYiZ* in Hebrew is the morphological form of verbs which are usually transitive. I discuss cases in which specific roots give rise to the labile alternation, otherwise unattested in the language. A straightforward analysis is suggested for the majority of cases, based on causative Voice_[+D]. This analysis is then extended to account for the labile exceptions, which inform how the idiosyncratic meaning of roots influences syntactic computation.

Keywords: degree achievement, causative, Hebrew, inchoative, morphology

1 Introduction

The verbal morphology of Modern Hebrew famously consists of seven “templates”, in which consonants (here X, Y and Z) slot into vocalic and affixal patterns (Doron 2003; Arad 2005; Borer 2013; Kastner 2016). Our focus is on the template *heXYiZ*, often called the “causative” form; verbs in it are generally active, as in (1).¹

- (1) a. **Causative:** *hefmid* ‘destroyed’, *hexnis* ‘inserted’, *hekpi* ‘froze’, ...
 b. **Unergative:** *hetspin* ‘went north’, *hedrim* ‘went south’, *hejmin* ‘went to the right’, *heemin* ‘believed’, *hegzim* ‘exaggerated’, *hemtin* ‘awaited’, *heflig* ‘set sail’, *hebit* ‘looked’, *heria* ‘cheered’, ...

¹ This template usually appears in the literature as *hiXYiZ*, with an /i/-/i/ vocalic pattern. Yet contemporary speakers use /ε/ (Trachtman 2016), and so I transcribe “e” throughout. Conversely, the initial /h/ is usually dropped in speech but I retain it for two reasons. First, /h/ is still pronounced by some older speakers and certain sociolinguistic groups, often marginalized ones (cf. Schwarzwald 1981a; Gafter 2014b). And second, the initial *h-* should help non-Semitic readers to distinguish this template from other ones.

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Hebrew does not generally have a labile alternation (zero-derivation as in English *break~break*), with the exception of certain verbs in *heXYiZ*.² The list in (1)—which is not meant to be comprehensive—presents a number of verbs that do not participate in the alternation. This is the unmarked case in *heXYiZ*: over 500 of the 550–600 verbs in this template would fit in this list.

I will use *inchoative* as a descriptive term: an inchoative verb in *heXYiZ* is one in which the sole argument has undergone the change of state (or changed on a scale). *Causative* is likewise a descriptive term here, identical in use to *transitive*: a structure with an external argument and an internal argument (complement to the verb). The two kinds will receive different analyses in Section 3.

Some examples of verbs that do undergo the alternation are given in (2). Even in those cases where the inchoative is frequent, a causative context can be set up fairly easily. Full lists are given later on, in Section 2.

(2) Alternating unergatives in *heXYiZ*:

- a. **Full alternation:** *heits* ‘sped up’, *heemik* ‘deepened’, *heerix* ‘lengthened’, *hek/jiax* ‘stiffened’, *heffir* ‘thawed’, *hefmin* ‘fattened’, *herza* ‘grew thin’, ...
- b. **Unergative preferred but causative innovation attested:** *hesriax* ‘stank’, *hesmil* ‘went to the left’,³ *hetsxin* ‘smelled pungent’, *herkiv* ‘rotted’, ...
- c. **Unaccusative preferred but causative innovation attested:** *he’edim* ‘reddened’, *helbin* ‘whitened’, *hefxir* ‘blackened’, *hevri* ‘got healthy’, *hexvir* ‘grew pale’,⁴ *hertsin* ‘became serious’, ...

2 A handful of examples in other templates includes *atsar* ‘stopped’ (often dispreferred to *neetsar* as an inchoative), *miher* ‘hurried’ and *ixer* ‘delayed’, with the latter two suggested by a reviewer and attested in use though not part of my own causative vocabulary.

3 Attested example for causative “leften”:

(i) *kol ha-kavod le-barak. hesmil et netanjahu*
all the-respect to-Barak. made.left ACC Netanyahu
‘Well done to [Ehud] Barak. He made [Benjamin] Netanyahu look like a leftist.’
<http://www.ynet.co.il/Ext/App/TalkBack/CdaViewOpenTalkBack/0,11382,L-4010352,00.html>

4 Attested example for causative “paleen”:

(i) ‘The girl looked as though someone wrapped her up in massive metallic toilet paper.
... *afilu ha-tseva ha-meanjen* [...] *hexvir et hofa’a-ta fel danst*
even the-color the-interesting paleed ACC appearance-hers of Dunst
‘Even the interesting color ... made Dunst’s appearance pale.’
http://www.mako.co.il/women-fashion/whats_in/Article-174f70ed642f121004.htm

The alternation is further exemplified by *heffir* ‘thawed’ in (3).

- (3) a. *ha-jaxasim ben ftej ha-medinot heffir-u axarej bikur*
 the-relations between both the-states thawed.CAUS-3PL after visit
rof ha-memfala
 head.CS the-government
 ‘The relations between the two countries thawed after the PM’s visit.’
- b. *bikur rof ha-memfala heffir et ha-jaxasim*
 visit head.CS the-government thawed.CAUS ACC the-relations
ben ftej ha-medinot
 between both the-states
 ‘The PM’s visit thawed the relations between the two countries.’

This paper attempts to understand, on the one hand, what is special about the roots in (2) that allows their verbs to alternate, and on the other hand, what is special about the morphological template that allows some verbs to alternate. A satisfying analysis of these patterns must address two questions: why these roots and why this template. I take these questions up in turn.

2 Roots

Based on the corpus of Ehrenfeld (2012), approximately 550–600 verbs exist in Modern Hebrew *heXYiZ*. Of these, 33 show the causative-inchoative alternation by my own estimate.⁵ The 33 alternating verbs are broken down as follows: 15 alternating unergatives and 18 alternating unaccusatives.

The analytical question is whether we can identify which roots form verbs that participate in the labile alternation. In this section I classify these verbs according to the broad lexical semantics of the root, building towards the claim that they are all degree achievements. The resulting classification is necessarily based on the existing verbs in *heXYiZ*, rather than on categories such as those in Levin (1993).

2.1 Classification

The classification also notes whether these verbs are unaccusative or unergative. Inchoatives demonstrably lack a Causer: they are compatible with ‘by

⁵ Arad (2005) counted 11 such verbs in her corpus whereas Laks (2011) found 34. Lev (2016) counted 81 in a survey taking into account many naturally attested, but perhaps spurious, forms.

itself' (Levin and Rappaport Hovav 1995; Alexiadou and Anagnostopoulou 2004; Koontz-Garboden 2009; Alexiadou and Doron 2012; Kastner 2017), for example, (4).

- (4) *ha-feleg heffir me-atmo*
 the-snow thawed.CAUS of-itself
 'The snow thawed by itself.'

They also pass unaccusativity diagnostics, although these are are fickle in Hebrew: the "possessive dative" of Borer and Grodzinsky (1986) has been critiqued by Gafter (2014a), Linzen (2014) and Bar-Asher Siegal and Boneh (2015, 2016), while verb preposing (Verb-Subject order in an otherwise SVO language, Shlonsky 1987) is not always reliable. See Kastner (2017) for discussion. Nevertheless, it is possible to find unaccusative verbs in *heXYiZ* which perform satisfactorily on the Verb-Subject order diagnostic. Barring a judgment survey, and given that I know of no comparable lists, the following lists reflect my own intuitions and will not be motivated as such.

First off, there are classes that contain only unergative (alternating) inchoatives. These include **verbs of emission**: *hesriax* 'stank', *hevijf* 'became putrid', *hetsxin* 'smelled pungent'⁶; **verbs of change of speed or direction**: *heits* 'accelerated', *heet* 'slowed down', *hesmil* 'went left'; and **verbs of change of sound**: *herijf* 'made loud noise', *hexrijf* 'quieted down'. One more unergative verb which does not fit into any of these categories is *hektin* 'escalated'.

Next we have classes whose inchoatives can be either unergative or unaccusative. For **verbs of change of consistency, taste or smell**, the unergatives are *hexmits* 'sour' and *herkiv* 'rotted'. The unaccusatives are *hekfiar* 'stiffened', *heffir* 'thawed', *hevfir* 'ripened' and *hekrim* 'crusted'. For **change of physical function, shape or appearance**, the unergatives are *heemik* 'deepened', *heerix* 'lengthened', *hetser* 'narrowed' and *hesmik* 'blushed'. The unaccusatives are *hefmin* 'fattened', *herza* 'thinned', *hezkin* 'grew old', *hekriax* 'became bald', *hevri* 'became healthy', *hertin* 'became serious' and *hexvir* 'grew pale'.

And lastly, there are classes whose inchoatives are solely unaccusative. These are the **verbs of change of color**: *heedim* 'reddened', *helbin* 'whitened', *heksil* 'became blue', *hetshiv* 'yellowed', *hefxir* 'blackened' and *hezviv* 'goldened'.

Additionally, *hexmir* 'deteriorated' appears to be an unaccusative verb that does not fall under any of the categories above.

⁶ Other verbs of emission do not entail change of state: *heki* 'threw up', *hezia* 'sweat', *heflits* 'farted'.

2.2 Discussion

A number of tentative generalizations can be drawn from the lists above: for instance, it seems clear that change of color allows for inchoative verbs (unaccusative ones). Yet a large degree of arbitrariness exists, as when we might also have expected the forms in (5) to exist, contrary to fact. The semantic criteria alone are not enough to predict how all roots in the language will behave.

- (5) a. Change of speed: **hemhir* (✗ *mahir* ‘quick’).
 b. Change of color: **hesgil* (✗ *sagol* ‘purple’), **hektim*/**hextim* (✗ *katom* ‘orange’).

It is also not the case that any root in the categories above necessarily derives an inchoative in *heXYiZ*: *heziz* ‘moved’ is a change of direction, *heftik* ‘shut up’ is a change of sound and *henmix* ‘lowered’ is a change of physical shape, but these three verbs (and many others) are only causative, never inchoative.

One insightful claim, made recently by Lev (2016), is that inchoatives in *heXYiZ* are degree achievements: change of state verbs which are derived from gradable adjectives (for related discussion see Dowty 1991; Hay et al. 1999; Rotstein and Winter 2004; Kennedy and Levin 2008; Bobaljik 2012, a.m.o). This hypothesis covers a fair bit of empirical landscape and I will adopt it in what follows, although it is important to note that it does not account for a few datapoints which Lev (2016) subsumes under a different part of his analysis.

Lev (2016) additionally sketches a theory in which labile verbs are less agentive in general, a claim that could explain why *heet* ‘slowed down’ is possible as opposed to **hemhir* (from ‘quick’), but that cannot be extended to explain the existence of minimally different *heits* ‘accelerated’. I leave the classification above as is, assuming the relevance of degree achievements and turning to examine the syntactic context.

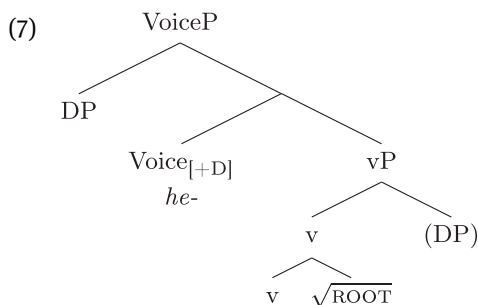
3 Template

Two questions must now be asked about *heXYiZ*: first, what is the appropriate formal analysis for verbs with this form? And second, why do labile alternations exist in this template alone? This section concerns itself with the first question of the two. I argue next that causatives have different structure than inchoatives, echoing claims made by Borer (1991). Causatives will be argued to be derived from the root, whereas inchoatives will be argued to be derived from an existing adjective or noun.

3.1 Causatives

As noted in the introduction, verbs in *heXYiZ* are almost always active (500+ out of the 550 or so). Furthermore, every inchoative has a causative alternation. If it is true that there is always an external argument, the presence of this argument should be encoded in the syntax. This goal is achieved using the functional head **Voice_[+D]** (Schäfer 2008; Wood 2015; Nie 2017; Oseki and Kastner 2017; Kastner 2018), the active counterpart of Voice (Kratzer 1996; Pylkkänen 2008) which I implement within Distributed Morphology (Halle and Marantz 1993): it requires that a DP be merged in its specifier, guaranteeing that an external argument appear, (6)–(7).

- (6) a. **Voice_[+D]**: Voice with a [+D] EPP feature, requiring that some element with a [D] feature merge in its specifier.
 b. $\llbracket \text{Voice}_{[+D]} \rrbracket = \lambda x \lambda e. \text{Cause}(x, e)$ (or Agent)
 With additional allosemes to be introduced in (12).



This head must be distinct from underspecified Voice, which I assume underlies the “simple” template *XaYaZ*. Given that the same root can be used to derive transitive verbs in both *XaYaZ* and *heXYiZ*, (8)—that is, verbs with identical syntactic structures—the difference between the forms must be due not to the structure but to the identity of Voice itself. For further motivation see Kastner (2016, 2017, 2018), Nie (2017) and Oseki and Kastner (2017).⁷

⁷ The representation of roots in (8) is meant as shorthand, obscuring many issues with their morphophonological analysis. See Faust (2012, 2016) and Kastner (2018).

(8)

	Root	<i>XaYaZ</i>		<i>heXYiZ</i>	
a.	$\sqrt{\text{axl}}$	<i>axal</i>	'ate'	<i>heexil (be-)</i>	'fed (with)'
b.	$\sqrt{\text{raj}}$	<i>raa</i>	'saw'	<i>hera (le-)</i>	'showed (to)'
c.	$\sqrt{\text{fma}}$	<i>fama</i>	'heard'	<i>hefmia (le-)</i>	'played (to)'
d.	$\sqrt{\text{nfm}}$	<i>nafam</i>	'breathed'	<i>henfim</i>	'resuscitated'

If we assume that the [D] feature on Voice_[+D] is an EPP feature, we can capture the simple (causative) cases: both an external argument and an internal argument are merged in the structure. The external argument satisfies [D] on Voice_[+D] and the derivation converges. Similarly for an unergative construction without the internal argument. But what of the inchoatives?

3.2 Inchoatives

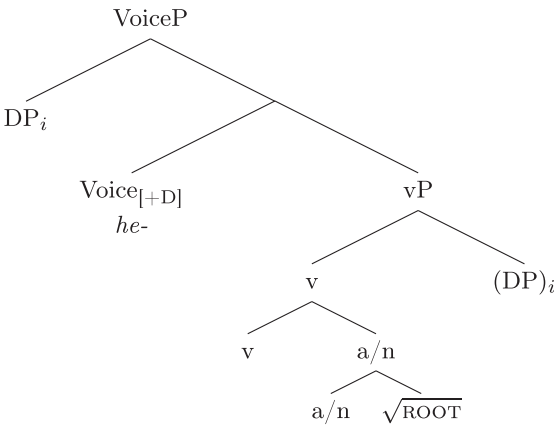
3.2.1 Structure

As a first step, I will assume that inchoatives in *heXYiZ* are never derived directly from the root, but from an underlying adjective or noun. A similar claim was already made by Borer (1991), who argued that causatives are derived directly from the root while these inchoatives are derived from an underlying adjective. As I point out here, inchoatives can also be derived from an underlying noun:

- (9) a. Underlying adjective: *he'edim* < *adom* 'red', *hefmin* < *famen* 'fat'.
b. Underlying noun: *heki* < *ki* 'vomit', *hetxin* < *taxana* 'stench'.

The structure is as in (10).

(10)



This assumption is admittedly a bit of a morphophonological stretch in certain cases (the verb *heits* ‘accelerated’ is arguably not derived from the noun *teutsa* ‘acceleration’, whose initial /t/ is not preserved), indicating that perhaps the claim should be weakened such that some inchoatives are derived from adjectives/nouns and other from the root. Nevertheless, the strong view carries a few benefits. First, it allows us to talk about different constructions in terms of explicit structures. Second, it allows for the degree semantics of the underlying adjective to transfer to the verb straightforwardly. And third, it makes a correct prediction.

My theory of morphosemantics assumes the so-called Arad/Marantz hypothesis, according to which the first categorizing head selects the alloeme of the root (Arad 2003; Marantz 2013; Anagnostopoulou and Samioti 2014). If (10) is the right structure for inchoatives, it is predicted that for roots which participate in the alternation, the causative might have a meaning that the inchoative does not share. This is because in causatives Voice_[+D] is local enough to the root to select a special meaning, whereas in inchoatives little a or little n will have already chosen an alloeme. This prediction is borne out by idioms involving *helbin* ‘whitened’, as in (11), and *hef/xir* ‘blackened’ (with the metaphorical meaning ‘tarnished’), as in Kastner (2016, 79).

- (11) a. Causative, literal meaning:

ha-sid ***helbin*** *et* *ha-kir*
the-lime.plaster whitened ACC the-wall
‘The lime plaster made the wall white.’

- b. Causative, non-transparent meaning:

sar *ha-xuts* ***helbin*** *ksafim*
minister the-exterior whitened moneys
‘The Minister of Foreign Affairs took part in money laundering.’

- c. Passive of causative, non-transparent meaning retained:

nitan *fe-ha-ksafim* ***hulben-u*** *al jedej sar*
was.claimed COMP-the-moneys whitened.PASS-3PL by minister
ha-xuts
the-exterior

‘It was claimed that the money was laundered by the Minister of Foreign Affairs.’

- d. Inchoative, only literal meaning:

ha-ftarot ***helbin-u***
the-bills whitened-3PL
‘The bills became white.’
(not: ‘The bills got laundered.’)

Borer (1991) provides additional arguments for deriving the inchoative from the adjective, though these have been subjected to some scrutiny in Kastner (2016, 83).

The full semantics for $\text{Voice}_{[+D]}$ looks as in (12), without introducing a causer for inchoative events in (12a–b):

- (12) a. $\llbracket \text{Voice}_{[+D]} \rrbracket = \lambda e.e / ___ (v) a$ (v does not select an allosume)
 b. $\llbracket \text{Voice}_{[+D]} \rrbracket = \lambda e.e / ___ (v) n$ (v does not select an allosume)
 c. $\llbracket \text{Voice}_{[+D]} \rrbracket = \lambda x \lambda e. \text{Cause}(x, e)$ (or Agent)

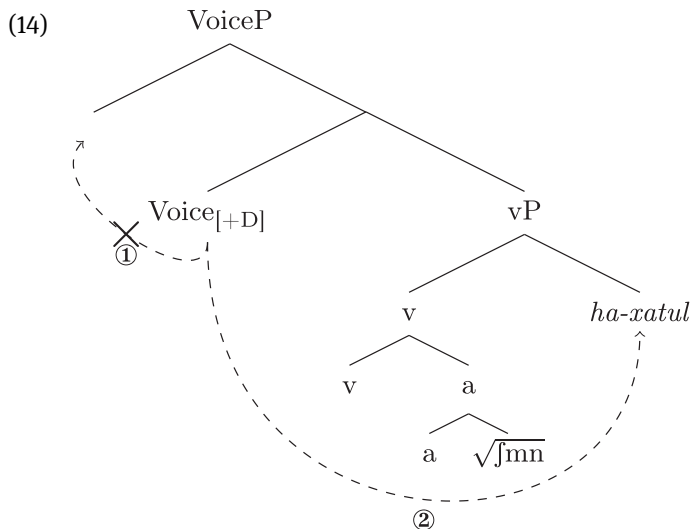
3.2.2 Derivation

The derivation proceeds straightforwardly for most cases, except that we must allow for unaccusative inchoatives. Our definition of $\text{Voice}_{[+D]}$, however, states that its EPP feature requires its specifier to be filled; this definition is not compatible with an unaccusative argument remaining low as in VS order.

To account for these cases, assume instead that the [D] feature on $\text{Voice}_{[+D]}$ requires valuation of phi-features (Nie 2017; Schäfer 2017). This valuation proceeds straightforwardly under Spec-Head Agreement but something else needs to be said if the sole argument in the phase is the internal argument. In this case, I propose that the feature [D] can be checked by the internal argument *in situ*: $\text{Voice}_{[+D]}$ probes into its specifier upwards, finds no target, and so it probes downwards and is valued by the internal argument. For more in-depth discussion of the direction of Agree, see works such as Béjar and Rezac (2009), Zeijlstra (2012), Preminger (2013) and Deal (2015).

Here is what this means for an inchoative example like (13) with the structure in (14). $\text{Voice}_{[+D]}$ has nothing in its specifier, so it probes downward and checks its unvalued phi-features with the internal argument *ha-xatul* ‘the cat’. The derivation converges in the syntax. The interpretation is as in (12a): no Cause is introduced.

- (13) *ha-xatul hefmin*
 the-cat fattened
 ‘The cat grew fat.’



As a consequence, ungrammatical cases like (15) must now be ruled out.

- (15) a. **ha-xatul hexnis*
 the-cat inserted
 (int. 'The cat got inserted')
- b. **ha-oto hemhir*
 the-car FAST.CAUS
 (int. 'The car grew fast')
- c. **ha-xatul hekpi*
 the-cat froze
 (int. 'The cat froze')

For (15a) there is no adjective 'inserted' that could be verbalized and no inchoative can be generated. In (15b) an adjective *mahir* 'quick' does exist, but it cannot be instantiated in *heXYiZ* in general due to some arbitrary gap, as already mentioned in Section 2 (or at least, I assume that this is an arbitrary gap, in lieu of a more principled explanation).

Finally, (15c) is not a possible inchoative even though there exists an underlying adjective, namely *kafu* 'frozen'. There are a number of possible explanations which can be pursued. One is that *freeze* is not a degree achievement in Hebrew, and so that adjective is not a possible input to the structure. Another

kind of explanation falls along the lines of extra-grammatical paradigmatic pressure, in that an inchoative (non-alternating) freezing verb already exists in another template: *kafa* ‘froze’ in *XaYaZ*. In this regard, I should note that speakers do steer clear of *heXYiZ* for certain inchoatives, instantiating them in other, more canonically non-active templates: *hitarex* ‘grew long’ in *hitXaYeZ* rather than *heerix*, *hizdaken* ‘grew old’ in *hitXaYeZ* rather than *hezkin*, *raza* ‘thinned’ in *XaYaZ* instead of *herza*, and *hitadem* ‘reddened’ in *hitXaYeZ* rather than *heedim* (but see Doron 2003, 22 for a grammatical difference between the two).

With the formal analysis in place, we can now turn to the final point of the discussion: why is the labile alternation formed in *heXYiZ* specifically?

4 The labile alternation

The main characteristic of Voice_[+D] is that it guarantees the availability of an external argument; in other words, a transitive construction is possible if the event has change-of-state semantics, i.e. an internal argument. Let us assume that the process of inchoative formation in *heXYiZ* is productive, as argued for by Lev (2016), and not a short list of exceptions, as assumed in most of the literature. Then, when the speaker is faced with the choice of a construction for their de-adjectival or denominal verb, they would choose Voice_[+D] because this structure guarantees that a causer can be added.

One consequence of this analysis is that it allows us to state in formal terms the difference in argument distribution between causatives and inchoatives. As seen in (1) and (8) above, active verbs in *heXYiZ* might be unergative, transitive or ditransitive. These possibilities are wiped out for inchoatives, which are uniformly intransitive. Let us assume that whatever requirements a verb has for its complements emerge upon combination of *v* and the root. I speculate that once the structure contains a more deeply embedded a/n node as in (14), *v* is too far away from the root for particular selectional requirements to be stated. This idea receives potential corroboration from the behavior of *-en* in English. As noted by Harley (2009), English verbalizers such as *-ify*, *-ize* and *-ate* can derive verbs that are uniformly unaccusative (e.g. *oscillate*), uniformly unergative (e.g. *detriorate*) or labile (e.g. *activate*), but *-en* verbs are always labile. An examination of the list in Levin (1993, 245) confirms this claim. If we assume that these latter verbs contain additional structure, for instance [*v* [CMPR [*a* $\sqrt{\text{Root}}$]]] (Bobaljik 2012), we arrive at a similar analysis to that of *heXYiZ* inchoatives: they cannot impose selectional restrictions and are “stuck” with the argument struc-

ture imposed by the syntax. But I will not push this point further due to space limitations.

Finally, the strong claim about separate derivational strategies for causatives and inchoatives awaits a more articulated semantic analysis. As a reviewer points out, in (3) the verb *heffir* means ‘thawed’, i.e. became warmer, while the underlying adjective *pofer* means ‘lukewarm’, i.e. not warm. Another incongruity between verb and adjective can be seen with *hefmin*, ‘grew fatter’, which does not entail that its argument becomes *famen* ‘fat’. Important discussion of the relevant scales and entailments is given by Borer (1991).

Discussion of alternative analyses is likewise not possible in the current paper. Three possibilities are existential closure over a Cause in Spec, Voice_[+D] (Doron 2003), treating *heXYiZ* like a standard verbalizing affix on a par with *-en* (Borer 1991); and a solution in terms of contextual allomorphy of Voice_[-D], the non-active counterpart of Voice_[+D]. These are all discussed in Kastner (2016, 81).

5 Conclusion

The template *heXYiZ* predominantly instantiates active verbs, usually causatives. It is also reasonably productive. Yet a number of roots derive inchoative verbs in this template. The analysis proposed here showed how the influence of a certain class of roots can be accommodated in the grammar, while keeping constant the overall behavior of the functional head which derives this template morphophonologically.

The two factors conspiring to create a labile alternation in a language that otherwise does not allow such an alternation are the root and the syntactic structure. The roots fall under various lexical semantic classes but all appear to derive degree achievements from underlying nouns or adjectives, as suggested by Lev (2016). The syntax which facilitates this derivation is one in which a noun or adjective is first formed before it is verbalized, and then combined with a specific causative head Voice_[+D]. This theoretical approach allows us to ask more specific questions about how the idiosyncratic information associated with roots interacts with the syntactic structure in which they are embedded.

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